

Claims

1. A genetically modified plant or part thereof comprising daidzein and/or derivatives thereof, wherein said plant or part thereof is active in flavonol and anthocyanin biosynthesis and comprises one or more nucleotide sequences encoding chalcone reductase and one or more nucleotide sequences encoding isoflavone synthase.
- 10 2. A genetically modified plant or part thereof according to claim 1, further comprising one or more nucleotide sequences encoding a chalcone isomerase capable of catalysing the conversion of 4,2',4'-trihydroxchalcone to 7,4'-dihydroxyflavanone.
- 15 3. A genetically modified plant or part thereof according to claim 1 wherein said one or more nucleotide sequences comprise sequences according to sequence identification numbers 1 and 3, or functional equivalents thereof.
- 20 4. A genetically modified plant or part thereof according to claim 2 wherein said one or more nucleotide sequences comprises sequences according to sequence identification numbers 1, 3 and 5, or a functional equivalents thereof.
- 25 5. A genetically modified plant or part thereof according to any one of the preceding claims wherein said plant or part thereof is selected from the group comprising tobacco, *Lactuca* sp., broccoli, asparagus, red cabbage, potato, spinach, rhubarb, red onion, shallot, aubergine, radish, Swiss chard, purple basil, watermelon and berries.
- 30 6. An extract of a plant according to any one of claims 1 to 5 wherein said extract comprises daidzein and/or derivatives thereof.
- 35 7. An extract according to claim 6 for use as a medicament.

8. An extract according to claim 6 for use in the treatment and/or prevention of one or more conditions selected from the group comprising; osteoporosis; cancer; menopausal and post menopausal symptoms comprising hot flushes, anxiety, depression, mood swings, night sweats, headaches, urinary incontinence; pre-menstrual syndromes comprising fluid retention, cyclical mastalgia, dysmenorrhoea; heart disease atherosclerosis; hypertension; coronary artery spasm; high cholesterol; Alzheimer's disease; impaired cognitive function; inflammatory diseases comprising inflammatory bowel disease, ulcerative colitis, Crohn's disease; and rheumatoid arthritis.

9. Use of an extract according to claim 6 in the cosmetic treatment and/or prevention of one or more conditions selected from the group comprising, sunlight induced skin damage, skin wrinkling, loss of skin sensitivity, loss of skin firmness, acne, poor hair condition and baldness.

10. Use of an extract according to claim 6 in a food product or nutritional supplement.

11. A genetically modified plant or part thereof according to any one of claim 1 to 5 for use in the treatment and/or prevention of one or more conditions according to claim 8.

12. Use of a genetically modified plant or part thereof according to any one of claim 1 to 5 in the cosmetic treatment and/or prevention of one or more conditions according to claim 9.

13. Use of a genetically modified plant or part thereof according to any one of claims 1 to 5 in an food product.

14. A food product comprising a genetically modified plant or part thereof according to any one of claims 1 to 5.

15. A food product according to claim 14 wherein said food product is selected from the group comprising packaged mixed salad, soup, spread, sauce, fruit bar and ice cream.

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16. A nutritional supplement comprising an extract according to claim 6.

17. A process for increasing the content of daidzein and/or derivatives thereof in a plant or part thereof, wherein said process comprises the steps;

(i) selecting a non-isoflavone producing plant wherein said plant or part thereof is active in anthocyanin and flavonol biosynthesis;

(ii) genetically modifying said plant to increase the activity of chalcone reductase and isoflavone synthase in said plant or part thereof.

20 18. A process according to claim 17, wherein said process further comprises genetically modifying said plant or part thereof to increase the activity of a chalcone isomerase capable of catalysing the conversion of 4,2',4'-trihydroxchalcone to 7,4'-dihydroxyflavanone.

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19. A process according to claim 17, wherein said plant is genetically modified to incorporate into the genome of the plant one or more nucleotide sequences according to sequence identification numbers 1 and 3, or functional equivalents thereof.

30 20. A process according to claim 18, wherein said plant is genetically modified to incorporate into the genome of the plant one or more nucleotide sequences according to sequence identification numbers 1,3 and 5 or functional equivalents thereof.

21. A process according to any one of claims 17 to 20 wherein  
said plant is selected from the group comprising, but not  
restricted to, tobacco, *Lactuca sp.*, broccoli, asparagus, red  
5 cabbage, potato, spinach, rhubarb, red onion, shallot,  
aubergine, radish, Swiss chard, purple basil, watermelon and  
berries.